Gasparite-(La) $La(AsO_4)$

Crystal Data: Monoclinic. *Point Group*: 2/*m*. As equant grains to 25 μm and in irregular aggregates to 50 μm or as elongated prismatic crystals to 2 mm.

Physical Properties: *Cleavage*: n.d. *Fracture*: n.d. *Tenacity*: n.d. Hardness = ~4.5 VHN = 308-340, 325 average (20 g load). D(meas.) = n.d. D(calc.) = 5.558

Optical Properties: Translucent. *Color*: Yellow to orange, dark gray under reflected light. *Streak*: n.d. *Luster*: Bright submetallic.
Optical Class: n.d.
R_1-R_2: (400) 11.19-9.05, (420) 12.04-9.82, (440) 12.35-10.15, (460) 12.35-10.13, (470) 12.16-9.95, (480) 11.97-9.77, (500) 11.45-9.44, (520) 11.15-9.17, (540) 11-9, (546) 10.98-8.98, (560) 10.92-8.9, (580) 10.88-8.84, (589) 10.87-8.83, (600) 10.85-8.81, (620) 10.85-8.77, (640) 10.89-8.74, (650) 10.92-8.77, (660) 10.94-8.79, (680) 11.09-8.86, (700) 11.23-9.08

Cell Data: Space Group: $P2_1/n$. a = 6.9576(4) b = 7.1668(4) c = 6.7155(4) β = 104.414(1)° Z = 4

X-ray Powder Pattern: Wanni glacier, Binn Valley, Valais, Switzerland.
3.156 (100), 2.956 (77), 3.361 (64), 2.004 (33), 1.923 (30), 1.78 (25), 2.693 (24)

Chemistry:	(1)	(2)		(1)	(2)
Fe_2O_3	0.05	0.00	Pr_2O_3	1.46	0.29
MnO	1.30	0.00	Nd_2O_3	4.24	1.04
CaO	1.33	0.34	Sm_2O_3	0.09	0.07
ThO_2	0.00	0.58	V_2O_5	9.77	0.00
Y_2O_3	0.01	0.01	P_2O_5	0.64	4.29
La_2O_3	40.21	35.59	As_2O_5	30.32	34.48
Ce_2O_3	10.69	22.55	Total	100.11	99.24

(1) Ushkatyn-III deposit, Central Kazakhstan; average of 5 electron microprobe analyses supplemented by Raman spectroscopy; corresponds to $(La_{0.65}Ce_{0.17}Nd_{0.07}Ca_{0.06}Mn_{0.05}Pr_{0.02})_{\Sigma=1.02}[(As_{0.70}V_{0.28}P_{0.02})_{\Sigma=1.00}O_4]$. (2) Wanni glacier, Binn Valley, Valais, Switzerland; average of 5 electron microprobe analyses supplemented by Raman spectroscopy corresponds to $(La_{0.59}Ce_{0.37}Nd_{0.02}Ca_{0.02}Th_{0.01})_{\Sigma=1.01}[(As_{0.81}P_{0.16}Si_{0.02}S_{0.02})_{\Sigma=1.01}O_4]$.

Mineral Group: Monazite group.

Occurrence: In veinlets in a layered manganese ore deposit (Ushkatyn-III deposit) or in alpine fissures in a two-mica gneiss (Wanni glacier).

Association: Friedelite, jacobsite, pennantite, alleghanyite, sonolite, sarkinite, tilasite, retzian-(La), calcite, rhodochrosite, hausmannite (Ushkatyn-III deposit); titanite, quartz, albite (Wanni glacier).

Distribution: In the Ushkatyn-III deposit, 300 km southwest of Karaganda and 20 km northeast of Zhayrem, Central Kazakhstan, and in rocks of the Wanni glacier, Binn Valley, Valais, Switzerland.

Name: A suffix designates the dominant lanthanide element, *La*, and the base name expresses the analogy to *gasparite*-(Ce). The new mineral is the arsenate-dominant analogy of monazite-(La).

Type Material: Mineralogical Museum, St. Petersburg State University, St. Petersburg, Russia (19692) and Musée Cantonal de Géologie, Lausanne, Switzerland (MGL 093518).

References: (1) Vereshchagin, O.S., S.N. Britvin, E.N. Perova, A.I. Brusnitsyn, Y.S. Polekhovsky, V.V. Shilovskikh, V.N. Bocharov, A. van der Burgt, S. Cuchet, and N. Meisser (2019) Gasparite-(La), $La(AsO_4)$, a new mineral from Mn ores of the Ushkatyn-III deposit, Central Kazakhstan, and metamorphic rocks of the Wanni glacier, Switzerland. Amer. Mineral., 104(10), 1469-1480.